Description

Method for negotiating bearer properties in IP networks

Newer communication architectures, which use packet-based or cell-based methods for voice signal transmission, such as Voice-over-IP (VoIP) or Voice-over-ATM (VoATM) for example, make provision for the separation of call control and user channel control. The communication between one or more subscribers such as ISDN subscribers, previously routed via conventional circuit-switched telecommunications networks for example, is then routed via IP networks. Conventional analog or ISDN terminals can continue to be used as terminals. The basic circumstances for ISDN subscribers between whom an Internet IP is arranged, can be taken from Fig. 1.

Basically the call processing networks are subdivided into units used for the transport of bearer information and units used for bearer control. To continue to make it possible to communicate using conventional circuit-switched telecommunication networks, e.g. PSTNs (Public Switched Telephone Networks), a "translation" between these two different transport technologies is required, which is undertaken in the coupling points.

At such a coupling point the first transport technology for the bearer information is converted into the second transport technology by means of specific devices known as Media Gateways (MG). Media Gateways possess both interfaces to PSTN/ISDN and also IP/ATM networks and thus form the interfaces between circuit-switched and packet-oriented networks. They can convert TDM (Time Division Multiplexing)-based voice transmission into packet (VoIP)-/cell (VoATM)-based voice

transmission and vice-versa.

The Media Gateways are controlled by central entities, the Media Gateway Controllers (MGC) (Fig. 1). The signaling information transmitted between two Media Gateway Controllers is transported for example by means of a BICC (Bearer Independent Call Control) protocol. The Media Gateway Controllers are used essentially for coordination of the Media Gateways and monitor/control (bearer) connections between the Media Gateways. The Media Gateways are controlled with the aid of the MGCP (Media Gateway Controller Protocol) or also the H.248 protocol.

Basically the transmission properties are defined in the Media Gateways. If for example the subscriber of an A-law country wishes to set up a connection to a subscriber located in a μ-law country these properties come into play. If the user information of the two subscribers is encoded in accordance with different laws, the user information must be converted. This problem arises for example with international telephone and data traffic from Europe (A-Law) to the USA (μ-law).

Before the conversion process the Media Gateways included in the information flow must negotiate with each other per connection setup jointly-supported "codecs and capabilities" (bearer properties) and agree on specific settings. To this end each Media Gateway maintains a list of bearer properties which it supports and which are already predetermined ex-works.

The problem with this is that only the two Media Gateways thus have knowledge of the negotiated properties. Under some circumstances however the network operator would now like, for network policy reasons (e.g. for economic reasons) to

negotiate specific bearer properties (e.g. codecs) with a priority other than that negotiated by the Media Gateways, or be able to exclude specific bearer properties (e.g. codecs, RFC2833, T38) altogether. This is not possible with this prior art.

The object of the invention is to demonstrate a way in which the negotiation of the bearer properties can be designed in such a manner that the rules for it can be modified at any time.

The object of the invention is achieved, using the features specified in the preamble of claim 1 as its starting point, by the characterizing features.

The advantage of the invention is its provision and maintenance of an additional reference list in the Media Gateway Controller. This provides the "network policy" in the Media Gateway Controller at a central point in the network. The Media Gateway Controller is thus given a master function in the network, i.e. its reference list is solely responsible for the group of Media Gateways controlled by the Media Gateway Controller independently of the status of the lists kept here. This allows the network operator to administer the bearer properties regardless of the size of his network (number of all Media Gateways/IP clients).

The simple modification of the network policy is achieved by undesired (i.e. unknown or blocked) bearer properties being filtered out by a comparison with the reference list in the Media Gateway Controller. The Media Gateway Controller of the A-side then re-assigns the priorities for the bearer properties remaining after the filtering on the basis of its own reference list. This additional reference list in the

Media Gateway Controller thus inserts a filter in the negotiation of the bearer properties between the Media Gateways and the partner Media Gateway Controller.

The invention is not restricted solely to Media Gateways/Media Gateway Controllers. It can also be applied in a similar manner to IP clients. Likewise the invention can also be applied to other networks or transport technologies such as ATM or MPLS for example, IP networks are not absolutely mandatory, although the invention is described with reference to IP networks.

Advantageous developments of the invention are specified in the subclaims.

The invention is explained in greater detail below with reference to exemplary embodiments shown in the form of Figures.

The figures show:

Fig. 1 a network configuration with PSTN/ISDN terminals, Media Gateways and Media Gateway Controllers,

Fig. 2 the method in accordance with the invention

In accordance with the invention each Media Gateway Controller is allocated a reference list. This contains the bearer properties which the network operator concerned supports in their network. This can for example be a predetermined number of codecs or a prioritization of the codecs. The reference list of the bearer properties and the priority of the relevant bearer properties should be able to be administered. In this way the network operator can configure the bearer properties

in the few Media Gateway Controllers as required.

In the present exemplary embodiment it is assumed, as shown in Fig. 2, that a subscriber of the A-side wishes to establish a connection to a subscriber of the B-side. The Media Gateway Controller MGC-A of the A-side is informed about this during the connection setup. Subsequently its reference list is compared with the list of the Media Gateway MG-A of the A-side (steps 1, 2) and the intersection between the two lists is formed. For example all bearer properties can be removed which are not in the own reference list or which are blocked in the own reference list. The result is notified by the Media Gateway Controller MGC-A to the Media Gateway Controller MGC-B of the B-side (step 3).

If the result (e.g. the new codec selected) is not supported by the Media Gateway Controller MGC-B of the B-side, the A-side is notified via a corresponding acknowledgement message of a rejection. Else this result is offered to the Media Gateway MG-B of the B-side (step 4). The bearer properties not supported here are removed from the offer and the result is incorporated into a list. This list is then made available via the Media Gateway Controller MGC-B of the B-side (step 5) and the Media Gateway Controller MGC-A of the A-side (step 6) to the Media Gateway MG-A of the A-side (step 7).

The negotiation is part of the connection setup. The user information can now be transmitted between the Media Gateway MG-A of the A-side and the Media Gateway MG-B of the B-side in accordance with the bearer properties negotiated.